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Inaugural Essay on,

Cynanche Trachealis.

by

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of

Pennsylvania.

"Unless we can form a theory without hypothesis, we had better confine ourselves to the mere relation of facts!"

Prof. Chem. Die.

1825.

An Essay &c.

This disease is in the class pyrexia and order phlegmasia, of the arrangement of Cullen. According to his definition, it consists, "in an inflammation of the glottis, larynx, or upper part of the trachea, whether it affects the membranes of these parts, or the muscles adjoining." From what will follow, this definition will be found deficient in more than one particular.

To this disease various other appellations have been given, by the different writers who have treated of the subject. It is called, suffocacio stridula; angina perniciosa; asthma infantum; morbus strangulatorius; cynanche stridula; angina epidemica; angina polyposa sive membranacea; peripneumonia trachealis. In popular language it is best known by the name of Croup, though several others expressive

of some of its most prominent symptoms have been given to it; as hives which is a corruption of heaves; the heaving of the lights; the choak or stuffing, &c. Some late writers have adopted the title, Trachitis, as harmonizing best with our medical nomenclature. This term, though expressive of the most ordinary nature of the disease, is objectionable as not embracing all its forms; for it will frequently terminate without any evidence of inflammation being present. To include all the phenomena presented in croup, under a term implying inflammation of the trachea, would be giving too wide a range to medical generalization. Might we not with equal propriety, apply the term, Enteritis, to most of the different kinds of colic, as that of trachitis, to a spasmodic case of croup?—

Cynanche Trachealis has mostly been con-

sidered as a disease of modern times, but Professor Chapman is of opinion, that some of the older authorities meant this complaint, when speaking of a very fatal species of angina, without swelling of the throat. It is said to have been particularly noticed so early as the year 1749, by one Martin Ghisi an Italian physician; and professor Chapman tells us in his lectures, that he found a distinct account of it in one of the earliest volumes of the transactions of the royal society of London. The writer who is an obscure practitioner, describes it as a new complaint, suddenly appearing in Cornwal, and committing very considerable ravages among the children of that place. Professor Home of Edinburgh published a correct account of the disease in 1765, and six years afterwards the valuable essay, of the venerable Dr. Bard of New York appeared on the

same subject.

By Cullen we are told, that Croup is confined to children under twelve years of age, and that it rarely attacks them before they are weaned. This is not strictly correct, for we have a number of well authenticated cases of it attacking adults, and also of infants within the month. Professor Hosack of New-York says, he never visited a child with it upwards of twelve years of age, except it had suffered from previous attacks. — As children under that age, are by far the most liable to the disease, it is probable that all who has it without an attack, will be exempt from it during the remainder of their lives. Some writers set the period of life which renders the system insusceptible to an attack, at puberty, and refer the cause to a change in the parts constituting the seat of the disease, denoted by a change in the

voice which takes place at that time. Without doubt it is a change in the parts constituting the seat of the disease, which diminishes the susceptibility to it, but it is not that change evinced by the change in the voice; for physiologists tell us that this chiefly consists in an enlargement of the rima-glottidis, and a lengthening of the trachea.—

Some authors have divided croup into two species, viz. idiopathic and symptomatic. There seems to be reason for this division, for there are several cases on record, where it was the consequence of other previous diseases. Dr. Rush observes "I have seen it accompany as well as succeed, the small-pox, measles, scarlet fever, and apthous sore throat." Besides Dr. Rush, we have others of equal authority, who corroborate his observation.— Croup has also been divided into spasmodic and inflam-

matory. This division, though of no practical importance, is nevertheless pretty well established. The slow process of inflammation, would be inadequate to the production of such violent symptoms, in so short a time, as we see sometimes induced by a sudden attack of croup. Also dissections of those who have died in the early stage of the disease, fully confirm its spasmodic nature in those cases; for none of the phenomena of inflammation are to be found.

Causes.

Cynanche Trachealis, by some writers, is alleged to be contagious. When it is symptomatic of a contagious disease, perhaps it may be transfered to another through that medium as a vehicle of communication; but that idiopathic croup ever depends upon contagion for its cause, there are not the slightest grounds to believe. It seems, however, to be peculiar to

some families of children, and frequently is hereditary; but this is not always the case, for I have seen every child of a family suffer from it, where the predisposition could not have been derived from either parent — they never having suffered from the complaint. — Children who have had one attack, are very liable to its returns.

A cold and moist atmosphere seems generally to be the exciting cause of this disease, and therefore, it is more apt to occur in winter and spring than any other season of the year. For the same reason it is more prevalent on the margin of the sea, and in marshy situations, than in more elevated lands. Though generally it can be referred to exposure, yet sometimes it presents itself without any appreciable cause. It is said to have occasionally prevailed as an epidemic. It is also endemical to particular places on the

sea board, and its extent is often very limited. It is said to be very common at Fells Point, while the city of Baltimore is almost exempt from it.

Symptoms.

A day or two previous to an attack, the child appears drowsy, stupid, and fretful; its eyes are suffused and heavy, and there is also a peculiar dry cough: this after some time becomes more violent, difficulty of respiration takes place, and every paroxysm produces great agitation. Febrile symptoms now arise, the face becomes flushed, the skin hot and dry, and the eyes are protuberant and anxious. As the disease advances, the respiration becomes more difficult, and the child in its agony, convulsively throws back its head to prevent suffocation. The pulse is quick and irritated. The child is

very restless and uneasy, and seems to experience the greatest degree of wretchedness without suffering any very positive pain.

The noise produced by coughing is very peculiar, and has been compared to something between the barking and yelping of a dog; and the respiration is performed with a hissing noise as if the trachea was closed with some soft spongy substance, and is thought to resemble the sound produced by forcing a piston up a dry pump.

In a great number of cases the disease does not make its attack thus slow and uniform. In these cases the complaint mostly comes on at night. After enjoying for some time, a sound and undisturbed repose, the child will be waked up to experience all the wretchedness above described, without any premonitory symptoms, or previous exposure to its or-

dinary causes. Professor Chapman observes that "cases of this kind are probably dependent on spasm, and will terminate fatally in a very short time where relief is not afforded." When this high degree of spasm does not produce a fatal termination in too short a time, it will not fail to excite inflammation, and when this has taken place the two forms of the disease may be considered as the same.

The seat of the disease is now in the larynx and upper part of the trachea, but if permitted to go on for ten or fifteen hours, the bronchia, and even the substance of the lungs become affected. The inflammation in these parts is subject to all the terminations to which that of other mucus surfaces is liable; and according to the termination, we will have the lungs engorged with mucus, coagulated lymph, pus, or even blood. The coagulated

lymph assumes the form of a hollow cylindric membrane, as it does in all other mucous surfaces.— The extension of the disease to the lungs may depend upon the continuous inflammation, but, from the slowness of that process in mucous membranes generally, and from the short time in which those organs will sometimes become involved, I was led to the conjecture, that it might be owing to the great difficulty they experienced in executing their function, from the constriction of the glottis. When the disease has reached the lungs, the symptoms are very different. The lips become livid, the eyes are prominent and inflamed, and there is a circumscribed blush on each cheek — the whole surface becomes mottled, and there is a wild and anxious expression of countenance; the pulse is full and disturbed, and the respiration exceedingly dif-

ficult and laborious, or, when the child is about to sink, the respiration becomes more easy, and the pulse weak and irregular. All the symptoms go to show, that the process by which venous blood is changed into arterial, is very much disturbed.

Post-mortem Examinations.

When the child dies in the very early stage of the disease, as sometimes happens, there is no appearance of inflammation having been present, to be found. In these cases the child dies from suffocation caused by spasm of the glottis.

When death does not take place for three or four days, there is found a white membrane, of considerable tenacity, lining the trachea, and sometimes extending down into the ramifications of the bronchia. The lungs are found gorged with a white mucoid mat-

ter, sometimes mixed with pus and coagulated lymph; or they are congested with blood forming the apoplectic condition of those organs. Cheyne tells us that he found the right auricle of the heart and the superior cava turgid with blood, as if the irritability of the heart and general system had been gradually exhausted by the forcing respiration through the tube of the windpipe, which was progressively diminished in capacity.

From this account it will appear that death is occasioned by suffocation, either from spasm causing constriction of the glottis, or from the membrane closing that orifice — or from congestion of the lungs, preventing the air from approximating the blood, and thereby ~~[illegible]~~ preventing the effecting that change which is so essential to its circulation. The latter is by far the most common cause of death: Cheyne

says ten to one. This shows us the great necessity of early arresting the progress of the disease.

Diagnosis.

Croup may very readily be confounded with cynanche laryngea. Indeed it was not until very lately that a diagnosis was established between them. — In cynanche laryngea there is a dificult and painful deglutition, with a swelling of the fauces; the voice is extremely hoarse, or reduced to scarcely an audible whisper. — In cynanche trachealis there is no swelling of the fauces, nor difficulty of deglutition: the noise produced by breathing, and also by the cough is very peculiar, so that if once heard, could hardly ever be mistaken. What, too, may assist in forming a diagnosis, is the different periods of life they generally appear — the one being almost exclusively confined to children, a-

while the latter rarely attacks them.

Cynanche trachealis may be distinguished from acute asthma by the following diagnosticks, which are taken from "Thomas' practice":— in the former the cough is frequent and ringing in our ears, while in the latter there is little or no cough. In croup there is seldom or ever any remission, while in the latter it is one of the most striking phenomena of the disease, and it is attended with some evacuations, such as belching, vomiting, or purging. In croup the pulse is strong with much febrile heat, the urine high coloured, and the voice shrill and small; in acute asthma, the pulse although perhaps equally quick, is less full, the urine is limpid, and the voice croaking and deep.

It is always of importance to distinguish the nature of the congestion which takes place

in the latter stages of the disease — whether it be sanguineous, or those other effusions forming catarrhus notha. When the engorgement is sanguineous, there is little or no cough or pituitous discharge, and what best distinguishes this state of the lungs, is the entire absence of wheezing. In the other state there is a cough with some degree of expectoration, and sometimes a considerable discharge of viscid mucus, which latter occuring well marks the nature of the complaint. The apoplectic condition of the lungs was first pointed out by the venerable Dr Bard of New York in his essay on croup before adverted to: he observes, "that he has found the pulmonary organs so dense and solid, that they exhibited the appearance of the structure of the liver." For the necessity of distinguishing this state of things, and for the treatment adapted to it, I be-

live we are entirely indebted to the professor of the practice of medicine, in this university. In congestion of any of the viscera, and especially the lungs, he considers the blood there accumulated, as so much taken from the general circulation, and hence a small quantity drawn would be sensibly felt, and perhaps be followed by serious consequences.

Prognosis.

Dr. Thomas in his "Practice of Physic," tells us that more than one half of the cases of croup terminate fatally. In this country, at least the mortality is by no means so great. Perhaps this difference depends more on the measures adopted for its cure, than upon any difference there may be in the severity of the disease in the two countries.

When there is a cessation of spasm, with a relief of the dyspnœa, and the voice becomes

more natural, with a copious and free expec-
toration, we may rely on a favourable termi-
nation. But when all the symptoms become
aggravated, when the pulse becomes irregu-
lar and intermittent, and the expectoration
ceases, we may almost consider the case as
desperate. The younger the child the greater
the danger.— When from feeble and inappro-
priate practice or otherwise, the disease has run
on to the second stage, the chances of recovery
are very much lessened. In this stage, when
the nails and lips become very livid, the pu-
pil widely dilated, and the respiration exce-
dingly laborious, we may prognosticate an
unfavourable termination. Almost the only chance
of recovery we have in this stage of the com-
plaint, is by the mechanical operation of an
emetic, which sometimes removes removes the
impediment to respiration, and thereby per-

milling the lungs to renew their accustomed function of decarbonizing the blood, which is so essential to its circulation. Indeed so rare is recovery from this stage of croup, that we need not expect it: Professor Hosack observes "that it might almost be denominated the fatal stage." When the child is about sinking under the disease, the respiration will become rather more easy, but the circulation will be weak and irregular.

Treatment.

Among the wide range of diseases to which children are peculiarly obnoxious, there is not one perhaps, which excites so much alarm in parents, or which demands such bold and decided measures on the part of the physician as a severe case of croup. There is no time for delay, lest from the continuance of high inflammatory actions, we should have coagulated in

lymph secreted, forming the membrane so much dreaded in this disease — or lest it be extended to the lungs producing the apoplectic condition of those organs, or, terminating in some of the ordinary secretions, forming catarrhus nothus

The indications in the treatment of croup are somewhat different in the different stages. In the commencement of an attack, our object is either to subdue spasm, or to restore the suppressed secretions of the trachea and surface of the lungs, and to prevent general excitement from taking place. To answer this indication there is nothing so efficient as copious and active vomiting. And to produce this effect the tartarized antimony is to be preferred, not only on account of the certainty of its operation, but also for the power it has of producing a determination to the surface, and thereby equalizing the circulation.

Also the smallness of its dose, and its entire want of taste, renders it peculiarly adapted to the cases of children. To a child under two years of age, from two to three grains should be given, every fifteen minutes, until it operates. To render it more active a little ipecacuanha and calomel may be united with it. At the same time the child should be placed in a warm bath to assist the operation of the emetic. Vomiting, assisted by the warm bath very rarely fails to afford relief, if timely employed. But if the emetic should fail to operate, (which is by no means uncommon in this disease); or if the complaint should have been left to itself for some time, or only aggravated by a multitude of family prescriptions, before the physician is called in, and a general excitement of the system has been induced, we have other indications to answer, and other remedies should be employed.

In this stage of the complaint, so high is the febrile excitement, and such the determination to the affected part, that the most efficacious means of diminishing the quantity of the circulating fluids, and of diverting the irritation from the seat of the disease, are loudly and promptly demanded. The lancet should be used very freely in proportion to the age of the patient; for children having a greater portion of fluids in proportion to their solids, than adults, bear the loss of blood much better, as well as the operation of some of the most active remedies, as purging, vomiting &c. To assist the general depletion, cups should be applied to the back and sides of the neck, and afterwards a blister to the throat.

Professor Hosack tells us, that relief is generally afforded after blood-letting, but it is often deceptive and of short duration. The

frequency of relapses, with that able practitioner after bleeding, can easily be accounted for, by recurring to the small quantities he recommends to be drawn at a time. To afford permanent relief, we should bleed copiously from a large orifice. Small and repeated bleedings are ineffectual in the commencement of almost all acute diseases, and more especially those of the respiratory system. Professor Chapman observes, "that detractions of blood, in a small or large quantity, operate as remedial processes very differently. The former abates the action only, while the latter alters it, or so far reduces it as to enable the natural energies of the system to subvert or overcome it, and to re-establish health." In this disease, the same gentleman recommends, where all other remedies fail, bleeding ad deliquium animi. As yet he has never known a failure when pushed to this extent. The sug-

gestion of this valuable remedy, he acknowledges to have derived from Dr. Dick of Alexandria. Of the practice I know nothing myself, but, eminating from such high authority there can be no doult of its efficacy.

Even where debility is to be apprehended, a large bleeding is to be prefered to small & repeated ones, as economising most the resources of the constitution; for to complete a cure the aggregate loss of blood will frequently be much greater, and the system will be more impaired from the longer continuance of the complaint. To remove every vestige of the disease an active purge should be given. Calomel in very large doses, is by far the most efficient article for this purpose. Should cough, or hoarsness, or tightness of the chest remain, the best expectorant medicine we can resort to is the Hive syrup

of Professor Cone, in small doses. This medicine will also assist in keeping up the impression made by the calomel.

These are the remedies adapted to bad cases of croup — but, where the attack is less violent, the above mentioned Syrup will be almost the only remedy necessary. In the commencement of an attack, it should be given in large doses, so as to produce emesis, and afterwards, this operation should be followed by small and repeated doses, which will not fail to produce a purgative effect. It will likewise promote expectoration.

This medicine should be kept by all parents who have croupy children, especially in the country; for this, when early administered, is safe, and will mostly prove effectual; whereas if the disease had been left to itself until a physician could have been procured, it —

might baffle all his efforts, or require all his skill to subvert.

Musk, asafoetida, camphor &c. have been recommended in this disease with a view to their antispasmodic powers; but here they are not entitled to the slightest confidence. Wherever they have been used, it has been attended with the greatest fatality; so much so, that their employment has been one great cause for this disease being placed among the aspernabria medicorum. Opium has also been employed, but it is entitled to no more of our confidence. —

I next come to the treatment of cynanche trachealis in its advanced stage. From what has been said it will be perceived, that at this period I consider the disease as one of the forms of Peripneumonia notha — either a congestion of the lungs with blood,

or Catarrhus Sicca. The indication now is to relieve the lungs of oppression, and to establish a free and equalle circulation. To answer this indication, copious and active vomiting should be induced; and for this purpose the vitriolic emetics are to be preferred. We may assist in arousing the susceptibility of the system, to the operation of medicines, by the application of a blister to the breast, or some more active agent in producing irritation. The doses of the medicine should be frequently repeated, and the auxiliary measures steadily persisted in for a considerable length of time. Where there is a sanguineous congestion, blood is to be drawn cautiously. We draw a little, then suppress the discharge and see what effect is produced upon the system. I have already spoken of the necessity of such extreme caution in the management of these cases.

Expectorants have been found useful in both these conditions of the lungs; and the hive syrup of Professor Cox may be considered among the best. A decoction of Polygala senega in combination with carbonate of ammonia, will also be found a very useful remedy. Not a little good can be derived in these cases from the inhalation of different vapours. The vapour of warm water is very useful, but its efficacy may be increased by the addition of stimulating articles, as ether or some of the balsams. Hoffmans anodyne liquor will also be found very useful. These inhallations may be considered as stimulants applied directly to the lungs; which will have the effect of arousing them from their torpor, to the healthy performance of their proper function.

Professor Francis of New-York has succeeded in three cases, in detaching the membrane by the mechanical operation ~~operation~~ of emetics. How far this may be trusted to, as a resource of the art, in these cases, remains yet to be tested. The great insusceptibility of the system to the operation of medicines in this disease, renders it almost impossible to get an emetic to operate; yet I think the practice promises more than the operation of tracheotomy, and should always be resorted to. This operation could only be successful where the disease was confined to the larynx, and upper part of the trachea, which is by no means a common occurrence. In a few cases the operation has been attended with success, but it should rarely be resorted to. —

Cynanche trachealis, in its early stage is as easily checked by our remedies as any

other acute disease; but if the alarming symptoms have continued, without mitigation, for six or eight hours, we may generally calculate on a fatal termination.—

The treatment I have adopted, it will be perceived, differs but little from that recommended by the Professor of practice in this university. Indeed it would be impossible to differ from him meterially without departing from general principles, and throwing myself on the bewildering road of empiricism.